

I. Dissection of the brain, gross anatomy of spinal cord

Parts of the brain

cerebrum:	telencephalon
	diencephalon
brainstem:	mesencephalon (midbrain)
	pons
	medulla oblongata
cerebellum	

Telencephalon:

1. Surfaces:
 - convex or superolateral surface
 - medial surface
 - basal or inferior surface
2. Fissures:
 - longitudinal cerebral fissure
 - transverse cerebral fissure
3. Sulci:
 - central, precentral, postcentral sulci
 - lateral sulcus
 - calcarine sulcus (or fissure)
 - parietooccipital sulcus
 - olfactory sulcus
 - hippocampal sulcus
4. Gyri, primary cortical areas (withouth the numbers of Brodmann areas)::
 - precentral gyrus (primary somatomotor cortex)
 - postcentral gyrus (primary somatosensory cortex)
 - transverse temporal gyri (=Heschl's gyri) (primary auditory cortex)
 - upper and lower lip of calcarine fissure (primary visual cortex)
 - cingulate gyrus
5. Classification of nerve fibers in the white matter (according to main function):
 - commissural fibers
 - o corpus callosum, parts: rostrum, genu, truncus (body), splenium
 - o anterior commissure
 - o hippocampal commissure (also fornix)
 - association fibers
 - projection fibers
6. on the Flechsig-cut:
 - basal ganglia: caudate nucleus, parts of lentiform nucleus, claustrum
 - internal capsule:
 - o parts:
 - anterior limb: frontopontine tract (Arnold's tract), ant. thalamic radiation
 - genu: corticonuclear seu – bulbar tract

- posterior limb: corticospinal tract, sup. thalamic radiation, temporoparietooccipitopontine tract (Türk's tract), acoustic radiation, optic radiation

o blood supply!

- external, extreme capsule
- insula (only recognition)

7. Lateral ventricle

- cavity of telencephalon
- parts, interventricular foramen
- without walls
- choroid plexus

Diencephalon

1. parts: thalamus, epithalamus, hypothalamus
2. III. ventricle

- cavity of diencephalon

- lamina terminalis, anterior commissure, columna fornicis, optic chiasm, mammillary body, cerebral aqueduct, pineal gland

- choroid plexus

Brainstem

Mesencephalon

1. cavity: cerebral aqueduct
2. structures to be recognized: tectum of mesencephalon, cerebral peduncle (tegmentum of mesencephalon + cerebral crus), interpeduncular fossa, sup. cerebellar peduncle

Pons

1. cavity: IV. ventricle (see below)
2. structures to be recognized: base and tegmentum of pons, middle cerebellar peduncle, bulbopontine sulcus, cerebellopontine angle

Medulla oblongata

1. cavity: IV. ventricle (see below)
2. structures to be recognized: pyramid, olive, medial and lateral parolivary sulci, gracile and cuneate tubercles

IV. ventricle

1. rhomboid fossa: median sulcus, facial colliculus, vagal trigone, hypoglossal trigone
2. sup. medullary velum, choroid plexus
3. median and lateral apertures of IV. ventricle

Cerebellum

1. structures to be recognized: hemispheres, vermis, nodulus, flocculus
2. cerebellar tonsil and its clinical significance
3. IV. ventricle (see above)

Spinal cord

1. macroscopy: anterior median fissure, posterior median sulcus, cervical and lumbar enlargement, conus terminalis, cauda equina
2. cross section: ventral and dorsal root, dorsal root ganglion, spinal nerve, ventral ramus (definition of nerve plexus), dorsal rami, anterior column, lateral column, posterior column

Meningeal layers of the brain

1. dura mater:
 - falx cerebri, tentorium cerebelli
 - blood supply, innervation
 - dural venous sinuses: superior and inferior sagittal sinus, straight sinus, confluens sinuum (confluence of sinuses), transverse sinus, sigmoid sinus, cavernous sinus, superior and inferior petrosal sinuses
2. arachnoid mater
3. pia mater
4. spaces between the meninges of brain, the content and clinical relations: epidural space, subdural space, subarachnoid space

Meningeal layers of spinal cord

1. endorachis, dura mater, arachnoid mater, pia mater
2. spaces between the meninges of spinal cord, the content and clinical relations: epidural space, subdural space, subarachnoid space

Circulation of cerebrospinal fluid (CSF)

1. production – choroid plexus
2. direction of CSF circulation, CSF drainage
3. definition of cistern
4. cerebellomedullary and pontocerebellar cistern

Blood supply of the central nervous system:

1. Arteries of the brain:
 - vertebral a.
 - ant. and post. spinal a.
 - post. inf. cerebellar a.
 - basilar a.
 - ant. inf. cerebellar a.
 - labyrinthine a.
 - rr. ad pontem
 - sup. cerebellar a.
 - post. cerebral a.
 - int. carotid a.
 - ophthalmic a.
 - post. communicating a.
 - ant. cerebral a.
 - middle cerebral a.
2. Veins of the brain
 - int. cerebral vein
 - great cerebral vein
3. Arteries of the spinal cord:

ant. and post. spinal a.

spinal branches

Vvsocorona

4. Veins of the spinal cord
internal and external venous plexuses

Cranial nerves

in details:

1. cranial nerve nuclei
2. types of nerve fibers
3. exit from the brain
4. exit from the skull
5. branches
6. sensory and autonomic ganglia

Brain sections

(for the images please visit http://an-server.pote.hu/OKT/_Jegyz/eJegyz.htm)

1. midsagittal

frontal and occipital poles
corpus callosum with its parts
thalamus
interventricular foramen
ant. cerebral a.
optic chiasm
tectum of mesencephalon
pineal gland
base and tegmentum of pons
medulla oblongata
cerebral aqueduct
IV. ventricle
sup.medullary velum
vermis cerebelli
calcarine fissure
cerebellomedullary cistern

2. horizontal

head of caudate nucleus
thalamus
putamen
globus pallidus (pallidum)
claustrum
insula
internal capsule
lateral ventricle with its parts
III. ventricle
hippocampus
corpus callosum

3. frontal

cerebral longitudinal fissure
lateral cerebral sulcus (fissure)
fornix
thalamus
II. ventricle

hippocampus
insula
putamen
pallidum
caudate nucleus
interpeduncular fossa
cerebral crus
parts of lateral ventricle
pons

II. Regions of the head and neck

in details:

1. The external carotid artery and its branches.
2. The subclavian artery and its branches. The scalenotracheal fossa.
3. The veins of the head and neck. The para- and retropharyngeal spaces.
4. Sensory innervation of the head and the neck.
5. Lymphatic drainage of the head and the neck.
6. Muscle triangles in the neck and their structures.
7. Muscles of facial expression and mastication. The mechanism of chewing.
8. Topography and innervation of the salivary glands.

III. Sensory organs

Visual organ

1. Walls and opening of the orbit **in details**
2. Content of the orbit:

muscles

rectus sup. m.
rectus med. m.
rectus inf. m.
rectus lat. m.
obliquus sup. m.
obliquus inf. m.
levator palpebrae superioris m.

connective tissue systems

fascial sheath of eyeball/ capsule of Tenon
orbital fat pad/ retrobulbar fat

blood vessels

ophthalmic a.
central retinal a.
sup. and inf. ophthalmic v.

nerves

ophthalmic n.
nasociliary n.
frontal n.
lacrimal n.
zygomatic n.
infraorbital n.
oculomotor n.
trochlear n.
abducent n.

3. Muscular apparatus and innervation

NOT TO BE KNOWN: eye movements and their controlling pathways

4. Visual pathway:

parts

retina
optic n.
optic chiasm
optic tract
lat. geniculate body
optic radiation
primary visual cortex – upper and lower lips of calcarine fissure

lesions

5. Protective organs of the eyeball:

lacrimal apparatus, innervation of the lacrimal gland

eyelids

conjunctiva

Organ of hearing and balance

1. parts

external ear
middle ear
inner ear

2. external ear

auricle

without detailed description

external acoustic meatus parts
innervation

3. middle ear

tympanic cavity
walls

1. labyrinthine wall
promontory
oval window
round window
prominence of facial canal
2. membraneous wall
tympanic membrane
3. carotid wall
int. carotid a.
musculotubal canal
4. jugular wall
int. jugular v.
5. tegmental wall
tegmen tympani
6. mastoid wall
mastoid antrum

parts:

epitympanum
mesotympanum
hypotympanum

nerves

chorda tympani
tympanic n.

auditory ossicles

malleus
incus
stapes
without their parts and ligaments

muscles

stapedius m. function and innervation
tensor tympani m. function and innervation

auditory tube

function, clinical relation

+ facial canal

course
branches of facial nerve

4. inner ear

parts

bony labyrinth
without further details:

vestibulum
oval window
round window
anterior, posterior and lateral semicircular
canals.
cochlea

membraneous labyrinth
without further details:

utricle
sacculle
anterior, posterior and lateral semicircular
ducts

cochlear duct

5. Parts of auditory pathway

spiral ganglion

cochlear nuclei

superior olivary complex

lat. lemniscus

inferior collicle

medial geniculate body

acoustic radiation

primary auditory (acoustic) cortex – transverse temporal gyri

I. Tracts, nuclei, systems

Spinal cord

TRACTS TO BE KNOWN (AS DETAILED AS IN THE LECTURE)

ascending pathways

dorsal column –medial lemniscus system:

fasciculus cuneatus, fasciculus gracilis
neurons and receptors of the tract
definition of epicritic sensibility
course and stations of the system
(spinal cord, brainstem, internal capsule)

spinothalamic tract:

ant. and lat.
neurons and receptors of the tract
definition of protopathic sensibility
course and stations of the system
(spinal cord, brainstem, internal capsule)

ant. and post. spinocerebellar tract

neurons and receptors of the tract
definition of proprioceptive sensibility
course and stations of the system
(spinal cord, brainstem)

descending pathways

corticospinal tract

origin, termination,
course and crossing

extrapyramidal tracts

without details
to be mentioned: rubrospinal tr., lat. vestibulospinal tr., reticulospinal tr.

REFLEXES TO BE KNOWN (AS DETAILED AS IN THE LECTURE)

proprioceptive reflex

nociceptive reflex

NO other reflexes (autonomic, mixed)!

Brainstem

CRANIAL NERVE NUCLEI

in details

fiber types in each cranial nerve

OTHER NUCLEI

pontine nuclei
gracile and cuneate nuclei

TRACTS

ascending

medial lemniscus
spinothalamic tract
lemniscus trigeminalis
lemniscus trigeminalis dorsalis
ant. and post. spinocerebellar tract

descending

corticospinal tract
corticonuclear tract
rubrospinal tract
reticulospinal tract
frontopontine tract
temporoparietooccipitopontine tract
pontocerebellar tract

medial longitudinal fasciculus

Diencephalon

see handout 'About thalamus for dentistry students'

Cerebellum

3 different parts with their functions:

spinocerebellum

vestibulocerebellum

cerebrocerebellum

TRACTS TO BE KNOWN (AS DETAILED AS IN THE LECTURE)

afferents

ant. spinocerebellar tract

post. spinocerebellar tract

vestibulocerebellar tract

pontocerebellar tract

trigemino-cerebellar tract

efferents

cerebellovestibular tract

cerebellothalamic tract

IV. Neurohistology

1. Histology of the skin

in details:

skin of the palm, HE
skin of the armpit, HE
hairy skin, HE
hairy skin, horizontal cut, HE
hairy skin, horizontal cut, AZAN

2. Neural tissue recap

in details:

peripheral nerve HE, OsO4
sensory ggl. HE, AgNO3
autonomic ggl. AgNO3

3. Glial tissue

in details:

protoplasmic and fibrous astrocytes, Au-sublimate

4. Histology of the spinal cord

in details:

spinal cord, HE

5. Histology of the cerebellum:

in details:

Cerebellum, HE

6. Cerebral cortex

in details:

cerebral cortex, HE

7. Histology of the visual organ

Eyebulb, HE **in details**

optic n. , HE **in details**

8. Histology of the inner ear

in details

Inner ear, HE

9. Endocrine glands

pituitary gland, HE

in details

thyroid gland, HE

in details

parathyroid gland, HE

in details

adrenal gland, HE

in details